

# Keynesian Economics After All

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It is demonstrated that the US economy has on the long-term in reality been governed by the Keynesian approach to economics independent of the current official economical policy. This is done by calculating the two-point correlation function between the fluctuations of the DJIA and the US public debt. We find that the origin of this condition is mainly related to the wars that the USA has fought during the time period investigated. Wars mean a large influx of public money into the economy, thus as a consequence creating a significant economical upturn in the DJIA. A reason for this straight-cut result of our analysis, is that very few wars have been fought on US-territory and those that have, were in the 18th century, when the partial destruction of cities, factories, railways and so on, was more limited and with less effect on the over-all economy.

What drives prices? This question has been debated and studied for centuries without any definite answer emerging. Especially in times of financial turmoil, where stocks in many cases are trading far below the so-called fundamental values, is this question important.

Besides the economical framework of Karl Marx, which we will not consider here since the topic of the present paper is the US markets, two main economical paradigms [12] exist. One is due to the work of Adam Smith [1] and advocates (more or less) completely free market conditions. The other is due to the work of John M. Keynes [6, 7] and, independently, Gunnar Myrdal [2–5]. Below we will briefly review and comment on these two paradigms. As the former has been the ruling paradigm in the western world for more than three decades, as well as in previous periods, *e.g.*, before and after the infamous crash of 1929 until the implementation of the “New Deal”, it can certainly be argued that it is responsible for the current financial turmoil. In support of this stand the quick shift in financial policies of the central banks all in most western economies, as well as others (China, Japan, *etc.*), can without any doubt be fitted into the framework of Keynesian economics.

Adam Smith (1723–1790) believed that the markets were in constant equilibrium as the intervention of an “invisible hand”, *i.e.* the market forces, would eliminate any inequality in demand and supply by adjusting the price of the commodity in question. This idea has been re-formulated in the framework of purely selfish hard-working rational traders with complete knowledge of all available information whose continuing effort more or less instantaneously removes any imbalance in prices (arbitrage opportunities) due to past differences in the expectations of traders. This model has been coined the “Efficient Market Hypothesis” (EMH) [8, 9].

The EMH states that current prices reflect all available information about the priced commodity; in other words, all available information is at any given instant already priced in by the market and any change in prices can only be due to the revelation of new information, *i.e.*, there is no “free lunch”.

On the macro-economical level, the EMH has meant that only monetary policies — changes in the interest rates of the central bank and the money balance [13] — are “allowed”. The “rest” is best dealt with through the forces of the markets. Since the 1980s and until the recent economical crises the EMH has been the dominant economical paradigm and has led to a massive deregulation of the financial markets, global trade and floating exchange rates. Quite ironically from today’s perspective, this kind of *laissez faire* economics in fact led to the Great Depression and not, as commonly believed, the crash of 1929 [14].

As EMH only addresses the relation between prices and available information, it can only be tested jointly with some asset-pricing model. This introduces an ambiguity in how to interpret anomalous behaviour of returns: Is the market inefficient to some extent or do we have an inaccurate price model? This to some extent turns the entire question into a matter of “religion” [10].

Another, more general problem, with standard models of financial markets is the following: If one assumes, as these models do, that the market participants are purely selfish individuals that optimize their own utility function through fixed time contracts with other nominally identical individuals, then, despite the achievement of mutual benefits, the

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term “contract” would not be defined in a general context. This is so because a general and lasting definition of the term “contract” requires long-term (meaning much longer than an ordinary human time span) institutions, which can only be upheld through non-selfish behavior. For example regulatory institutions have been built during centuries and hence cannot be put to work within a framework of purely selfish individuals who’s time horizon can’t possibly be longer than their own life span. This means that important psychological and social factors must exist to counter a purely selfish behaviour. Hence, as most models of the financial markets are based on EMH, they lack two very essential ingredients, which one usually denote by the general word “culture” and “psychology” [11].

The second economical paradigm is due to John M. Keynes (1883–1946) and Gunnar Myrdal (1898–1987) [2–7]. The basis of Keynes economical work is that at times, market forces will push the economy so far from equilibrium that it is necessary for governments and central banks to take rigorous financial actions such as increased government spending and tighter regulation of the markets. In short, using the characterization attributed to Keynes; “The markets can stay irrational longer than you can stay solvent”.

The work of Keynes was highly popular among the governments of the western world after the Second World War (WW2) and until the 1980s partly due to the success of Roosevelt’s “New Deal” policy designed to deal with the financial disaster initiating the Great Depression of the 1930s. The most prominent post-WW2 example is the Marshall aid, but also the establishment of socialized benefits in the 1960s, such as unemployment insurance and state subsidized education and medical care, are noteworthy examples of Keynesian economics. Also, the concept of devaluation or revaluation of a country’s currency is a prime example of Keynesian economics.

It should be mentioned that the work of Keynes has been criticized by many economists from a theoretical standpoint as it lacks a firm theoretical basis, *i.e.*, it is more pragmatic than axiomatic. This discussion is beyond the scope of the present paper. However, the Swedish economist Gunnar Myrdal has in part provided the work of Keynes with a more firm framework, besides incorporating sociological elements into economics [2–5]. For this contribution G. Myrdal was in 1974 awarded Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel (unofficially the Nobel Price in Economics) [15].

We will now show that the primary long-term factor, *i.e.* over decades, driving the US economy during the entire history of the USA has been of the Keynesian type independent of what the ruling economical paradigm has been. To this end we present in Fig. 1 the historical public debt of the US together with a labeling of the most significant historic events, mostly military conflicts, involving the US during the same period. Notice that the Korean War (1950–1953) with its formal UN-forces did not represent any significant increase in US public debt. However, the so-called Cold War (1947–1991) between the USA and the USSR most certainly did. It is clear that the over-all rise in the public debt is exponentially driven by large “bumps” signifying rapid growth in public debt. It is striking that, on a qualitative level, the origin of these large growth periods in US public debt is mainly related to wars with two major exceptions; the purchase of the Louisiana Territory from Napoleon in 1803 on the unauthorized initiative of the US-ambassador to France, and the Keynesian (in the meaning massive public investments) “New Deal” policy of Roosevelt in the 1930s. Note, that the use of a logarithmic scale in Fig. 1 is the reason why the “bumps” associated with the purchase of the Louisiana Territory and the Spanish War of 1898 do not “stand out”.

If one compares the US public debt to the behaviour of the US stock market here quantified by the DJIA (Fig. 1), one clearly sees that on a qualitative level the rises in the public debt, due to wars and New Deal, are followed by steep rises in the stock market with one big exception, namely the bubble of the 1920s. In hindsight, this may not be so surprising, since increases in public debt normally means large public spending which funnels large amounts of money into the private sector. This relation can be made quantitative by defining a (gliding) two-point correlation function between the US public debt,  $d(t)$ , and the DJIA index,  $p(t)$ , in the following way

$$C_{\Delta t}(t) = \frac{\langle [d(t) - \langle d(t) \rangle_{\Delta t}] [p(t) - \langle p(t) \rangle_{\Delta t}] \rangle_{\Delta t}}{\sigma_d(t; \Delta t) \sigma_p(t; \Delta t)}, \quad (1)$$

where  $\langle s(t) \rangle_{\Delta t}$  and  $\sigma_s(t, \Delta t) = \langle [s(t) - \langle s(t) \rangle_{\Delta t}]^2 \rangle_{\Delta t}^{\frac{1}{2}}$  denote the average and root-mean-square-value, respectively, of the time series  $s(t)$  over a time window of length  $\Delta t$  that is centered at  $t$ . In this way, and with  $\Delta t = 5$  years, we obtained the correlation function shown in the lower panel of Fig. 1.

We note that the annual average growth rate of the US public debt is about 8.6% (upper green dashed line in Fig. 1). This figure should be compared to the average annual growth rate of the DJIA that until the 1950s was about 2.5%. This discrepancy basically explains the exponential growth in the US public debt. What is surprising, however, is that most time periods with peace exhibit a significant decline in the public debt, most notably the period after the war of 1812 until the second war with the Seminole Indians (1835–1842)[16], as well as modest growth in the DJIA. In the first half of the 19th century, the US public debt dropped to a meager US\$ 33 733 in 1835 from US\$ 75 463 477 in 1791 [17]. Hence, with respect to long-term growth in the stock market, public spending, especially in the case of war, has played a *very* significant role in the long-term growth of the US economy and therefore of the DJIA.

In conclusion, we have demonstrated, that the main long-term driving force of the US economy through the entire history of the USA has been massive public investments in the private sector, financed by significant increases in public debt, during times of war.

### Acknowledgments

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  - [12] We call them “paradigms” and not “theories”, as most economics are axiomatic.
  - [13] “Money balance” refers essentially to the supply of money. The central banks can affect the money balance by buying or selling treasury securities. Secondly, the discount rate can be changed. And finally, the Federal Reserve can adjust the reserve requirement of private banks.
  - [14] In November 1920, Warren G. Harding was elected president followed by presidents Coolidge and Hoover, leading to 12 consecutive years of Republican control of the White House and strongly pro-business government policy. In practice this meant as little government influence as possible, since the administrations of Presidents Harding, Coolidge, and Hoover all believed the rules of Adam Smith still applied.
  - [15] As Alfred Nobel didn’t believe economy to be a science, he did not establish a prize in this field. In 1968, the Swedish Central Bank established a pseudo-Nobel Prize in economy. Recently, there has been some controversy around the name of this prize, as some members of the Nobel family want to stop the use of the name “Nobel” for this prize.
  - [16] “Surprisingly”, the Seminole Indians did not want to move from Florida to Idaho.
  - [17] In 1790, the Federal Government declared that it was redeeming the Scrip Money that was issued during the Revolutionary War in the amount of US\$ 80 000 000.

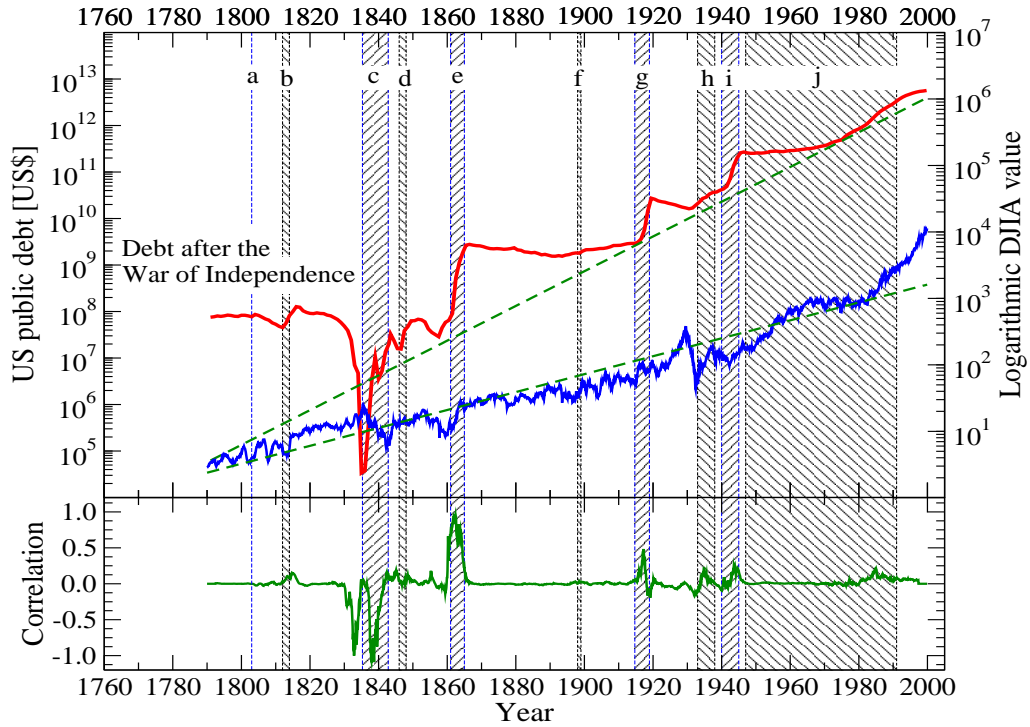


FIG. 1: (top panel) The historical US public debt (red curve) and the value of the DJIA (blue curve) from 1791 till 2000. The two dashed diagonal lines represent exponential functions corresponding to an average growth rate of about 8.6% (for the debt) and 2.5% for the DJIA index. Some historic events are marked by dashed areas in the figure: (a) the 1812 war (1812–1814); (c) the second war with the Seminole Indians (1835–1842); (d) The Mexican-American War (1846–1848); (e) The Civil War (1861–1865); (f) The Spanish American War (1898); (g) The First World War (1914–1918); (h) the “New Deal” policy (1933–1938); (i) The Second World War (1940–1945) (j) The Cold War (1947–1991). (bottom panel) The time dependent 5 year gliding two-point correlation function,  $C_{\Delta t}(t)$ , between the US public debt and the value of the DJIA index.